

REMARKS**Status of the claims**

Claims 37-40, 42-50, and 70-71 are pending in the application. Claims 37 and 39 are currently amended. Claims 1-36, 41, and 51-69 were previously canceled. Claims 37-40, 42-50, and 70-71 stand rejected in the application. No new matter is added.

Amendment to the claims

Claim 37 is amended to incorporate the limitation of the antenna comprising at least one coil to generate an alternating magnetic field (this amendment is supported by the specification on page 13, lines 3-6; page 28, lines 1-46 & 29-31), and the limitation of the energy absorbing species, which is inductively heatable by the magnetic field and which is effective to transduce heat generated therein to the substrate and to a reactant (this amendment is supported by the specification on page 15, lines 24-27; p.17, lines 19-20; p. 19, lines 7-13; p. 28, lines 29-31; p.34, lines 18-23). Claim 39 is amended to recite *in vivo* (this amendment is supported by the specification on page 34, lines 26-27).

Claim Rejections under 35 U.S.C. §103

Claims 37-40, 45-49 and 71 stand rejected under 35 U.S.C. §103(a) as obvious over *Flomenblit et al.* (USPN 5,562,641) in view of *Healy et al.* (USPN 5,670,161). Applicant respectfully traverses the rejection.

The Examiner argues that regarding claims 37-38, 45 and 71, *Flomenblit et al.* disclose a device for tissue treatment comprising: a radiofrequency power supply, an antenna connected to said radiofrequency power supply, and an energy absorbing species. *Flomenblit et al.* do not disclose a reactant. *Healy et al.* disclose a treatment system including a biodegradable stent and teach coating the stent with a drug in order to enhance therapeutic effect. Therefore, the Examiner concludes at the time of the invention it would have been obvious to one of ordinary skill in the art to modify the invention of *Flomenblit et al.* as taught by *Healy et al.*, to provide the stent with a coating comprising a drug in order to enhance the therapeutic effect.

The currently amended independent claim 37 recites a device for the treatment of substrates that comprises a radiofrequency power supply; and an antenna, comprised of at least one coil to generate a magnetic field, connected to the radiofrequency power supply; and an energy absorbing species that is inductively heatable by the magnetic field, which then transfers

the heat generated therein to the substrate and to a reactant. The dependent claims recite the substrate is a tissue, cell, protein, lipid, nucleic acid, or carbohydrate (claim 38); the substrate is *in vivo* or *in vitro* (claim 39); the radiofrequency energy is in the frequency range of 20KHz-40GHz. (claim 40); the said energy absorbing species is a susceptor (claim 45), and comprises matter with non-zero electrical conductivity (claim 46), and is diamagnetic, paramagnetic, or ferromagnetic (claim 47), and is an ionomer, a conducting polymer, an alkali metal, a transition metal, a lanthanide, or a metalloid or a combination thereof (claim 48), and is colloidal or non-colloidal gold, silicon, cadmium selenide, cadmium sulfide, ruthenium, indium phosphide, indium arsenide, gallium arsenide, gold maleimide, gallium phosphide, hydroxysuccinimidyl gold, nickel-copper, nickel-palladium, palladium-cobalt, nickel-silicon, stainless steel, iron oxide, ferrite, titanium, Phynox, palladium/cobalt alloys, nitinol, titanium, titanium alloys, zirconium, gadolinium, aluminum oxide, dysprosium, cobalt alloys, nickel, gold, palladium, tungsten, or alloys of materials from this group (claim 49); and a reactant comprising a pharmaceutical or a diagnostic compound (claim 71).

The Applicant submits **Flomenblit et al.** disclose a stent for placing in a tubular organ so as to support its diameter to remain above a critical diameter (Abstract). The stent comprises a spiral coil or cylinder made of a two-way shape memory alloy that has two transition temperatures within a range that will not damage biological tissue, of which a first transition temperature changes from the soft state to the super-elastic state and of which a second transition temperature is a temperature in which it changes from the super-elastic state to the soft state (Abstract). **Flomenblit et al.** disclose the stent uses conductive (direct contact) application of heat to cause it to stretch out, *i.e.* heated fluid (col 4, lines 15-32), or electricity (col 4 lines 60-61; col 5 lines 9-12), or radiofrequency electromagnetic irradiation in the microwave range to transmit through an antenna to cause the stent to heat up and expand (col 4, lines 61-62; col 5 lines 31-40). The radiofrequency antenna (Fig. 5, item 62), a straight wire, is located inside the lead, which is connected to the radiofrequency energy source of microwaves.

The Applicant submits that **Flomenblit et al.** do not disclose use of electromagnetic energy to generate an magnetic field. As well, **Flomenblit et al.** do not disclose use of an energy absorbing species that is comprised of magnetic materials. Moreover, **Flomenblit et al.** do not disclose an antenna that has at least one coil, and a reactant. Therefore, **Flomenblit et al.** does not provide an adequate suggestion or motivation to one of ordinary skill in the art to modify a fluid heated, or electrically heated, or microwave heated stent to the device of

the instant invention that uses heat, induced by a magnetic field from a coiled antenna and electromagnetic energy, to treat a substrate and reactant.

The Applicant submits that *Healy et al.* disclose a biodegradable stent that is capable of being absorbed by the human body, and that also may function as a drug or nutrient delivery system as a result of its biodegradable properties (col 1, lines 3-8). *Healy et al.* further disclose drugs designed and applied in quantities to permit timed release *in vivo* as stent and/or coating biodegrades (col 10, lines 24-26).

The Applicant submits that *Healy et al.* do not disclose use of electromagnetic energy to generate a magnetic field, nor an energy absorbing species that is comprised of magnetic materials, and do not disclose an antenna that has at least one coil. Therefore, *Healy et al.* is deficient in suggestion or motivation to one of ordinary skill in the art to modify a biodegradable device that is coated with drugs to permit timed release to the device of the instant invention that uses radiofrequency energy and an antenna to generate a magnetic field and induce heat in an energy absorbing species with magnetic properties, to treat substrates and a reactant.

Combining *Flomenblit et al.* and *Healy et al.* does not remedy the deficiencies of the prior art references singly. The combination of *Flomenblit et al.* and *Healy et al.* do not teach a device with a radiofrequency power supply and an antenna to generate a magnetic field in a energy absorbing species made of magnetic material, to induce heat and treat a substrate and a reactant. Thus, *Flomenblit et al.* and *Healy et al.* do not provide motivation, or a reasonable expectation of success, or suggest the instant claim limitations, to one of ordinary skill in the art to modify to the instant invention. Therefore the subject matter of the instant claims are not rendered obvious by *Flomenblit et al.* and *Healy et al.* Accordingly, in view of the arguments presented herein, Applicant respectfully requests that the rejection of claims 37-40, 45-49 and 71 under 35 U.S.C. §103(a) be withdrawn.

Claims 42-44 stand rejected under 35 U.S.C. 103(a) as obvious over *Flomenblit et al.* (USPN 5,562,641) in view of *Healy et al.* (USPN 5,670,161) and further in view of *Rudie et al.* (USPN 6,032,078). Applicant respectfully traverses the rejection.

The Examiner argues that *Flomenblit et al.* in view of *Healy et al.* disclose the subject matter of claim 42 except for disclosing the antenna comprises at least one electrical conductor. *Rudie et al.* disclose a catheter device and teach a catheter with an antenna comprising a flat ribbon wire to deliver radiofrequency energy. Thus, the Examiner concludes at

the time of the invention it would have been obvious to one of ordinary skill in the art to modify the invention of **Flomenblit et al.** in view of **Healy et al.** as taught by **Rudie et al.**, to provide the catheter with an antenna comprising a flat ribbon wire in order to deliver radiofrequency energy.

The currently amended independent claim 37 recitation is stated *supra*. Dependent claim 42 recites that the antenna comprises at least one electrical conductor; claim 43 recites that the electrical conductor is solid wire or hollow tubing; and claim 44 recites that the antenna is of a substantially planar geometry, or of a non-planar geometry, or is a solenoid antenna.

The Applicant submits that as discussed *supra*, **Flomenblit et al.** do not disclose use of electromagnetic energy to generate a magnetic field; nor use of a coiled antenna to generate a magnetic field; nor heat induction by a magnetic field in an energy absorbing species comprised of magnetic materials; nor disclose a reactant. As well, **Healy et al.** do not disclose use of radiofrequency energy to generate a magnetic field, an energy absorbing species comprised of magnetic material, and do not disclose an antenna that has at least one coil. Together, **Flomenblit et al.** and **Healy et al.** do not teach a device with a radiofrequency power supply and a coiled antenna to generate a magnetic field in an energy absorbing species made of magnetic material, to induce heat and treat a substrate and a reactant. Thus, **Flomenblit et al.** and **Healy et al.** do not provide motivation, or a reasonable expectation of success, or suggest the instant claim limitations, to one of ordinary skill in the art to produce the claimed invention.

The Applicant submits **Rudie et al.** disclose transurethral microwave thermal therapy of benign prostatic hyperplasia using a microwave antenna-containing catheter (col 1, lines 25-26, and claim 1). **Rudie et al.** use heat generated by microwave energy, focused by a helical dipole antenna, to treat interstitial tissues.

Rudie et al. do not disclose generating a magnetic field from electromagnetic energy, nor disclose use of a coiled antenna to generate a magnetic field, nor use of an energy absorbing species that has magnetic properties to induce heat in a substrate and reactant. Therefore, **Rudie et al.** is deficient in suggestion or motivation to one of ordinary skill in the art to modify a microwave thermal therapeutic device using a microwave focusing helical dipole antenna to the device of the instant invention that uses electromagnetic energy and a coiled antenna to generate a magnetic field, and induce heat in an energy absorbing species with magnetic properties, to treat substrates and a reactant. Furthermore, combining **Flomenblit et al.**, **Healy et al.**, and **Rudie et al.**, do not provide motivation, or a reasonable expectation of success to one of ordinary skill in the art to produce the claimed invention. Therefore the subject matter of the instant claims are not rendered obvious by **Flomenblit et al.**, **Healy et al.**, and **Rudie et al.**

Accordingly, in view of the arguments presented herein, Applicant respectfully requests that the rejection of claims 42-44 under 35 U.S.C. §103(a) be withdrawn.

Claims 50 and 70 stand rejected under 35 U.S.C. 103(a) as obvious over *Flomenblit et al.* (USPN 5,562,641) in view of *Healy et al.* (USPN 5,670,161) and further in view of *Pinchuk et al.* (USPN 6,545,097). Applicant respectfully traverses the rejection.

The Examiner argues that regarding claims 50 and 70, *Flomenblit et al.* in view of *Healy et al.* disclose the claimed invention except for the polystyrene encapsulated metal particle, and the reactant is a protein, lipid, nucleic acid or a carbohydrate. *Pinchuk et al.* disclose a drug delivery composition and method, and teach coating stents with a copolymer and a drug to vary the rate of the drug release. As well, *Pinchuk et al.* teach a wide variety of therapeutic agents including proteins, as candidates for vascular treatments. Therefore, the Examiner concludes at the time of the invention it would have been obvious to one of ordinary skill in the art to modify the invention of *Flomenblit et al.* in view of *Healy et al.*, as taught by *Pinchuk et al.* to coat a stent with a copolymer and drug in varying ratios in order to vary the rate of drug release, and also further taught by *Pinchuk et al.*, to provide a wide variety of therapeutic agents including proteins, as candidates for vascular treatments.

The currently amended independent claim 37 recitation is stated *supra*. Dependent claim 50 recites the energy absorbing species is a metal nano- or micro-particle, a semiconducting nano- or micro-particle, a magnetic nano- or micro-particle, a polystyrene encapsulated metal particle, a buckminsterfullerene, or a liposome-encapsulated metal particle; and claim 70 recites the reactant is a protein, a lipid, a nucleic acid, or a carbohydrate.

The Applicant submits that *Pinchuk et al.* disclose a composition for delivery of a therapeutic agent and to biocompatible block copolymer materials useful with intravascular or intervascular medical devices. Thus *Pinchuk et al.* disclose a reactant.

Pinchuk et al. do not disclose generating a magnetic field from electromagnetic energy, nor disclose use of a coiled antenna to generate a magnetic field, nor use of an energy absorbing species that has magnetic properties to induce heat in a substrate and reactant. Consequently, *Pinchuk et al.* is deficient in suggestion or motivation to one of ordinary skill in the art to modify a composition for therapeutic agent delivery to the device of the instant invention that uses radiofrequency energy and a coiled antenna to generate a magnetic field, and induce heat in an energy absorbing species with magnetic properties, to treat substrates and a reactant. Furthermore, combining *Flomenblit et al.*, *Healy et al.*, and *Pinchuk et al.* do not provide

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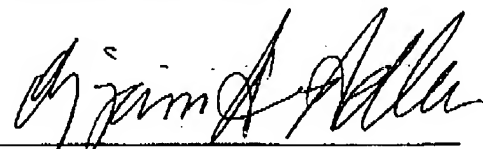
motivation, or a reasonable expectation of success to one of ordinary skill in the art to modify to the instant invention. Therefore the subject matter of the instant claims are not rendered obvious by *Flomenblit et al.*, *Healy et al.*, and *Pinchuk et al.* Accordingly, in view of the arguments presented herein, Applicant respectfully requests that the rejection of claims 50 and 70 under 35 U.S.C. §103(a) be withdrawn.

This is intended to be a complete response to the Office Action, mailed August 16, 2007. If any issues remain outstanding, the Examiner is respectfully requested to telephone the undersigned attorney of record for immediate resolution. Applicant encloses a Petition for a Two Months Extension of Time. Please charge the \$230 fee to the credit card identified on the enclosed Form PTO-2038. Only in the absence of Form PTO-2038, please debit any applicable fees from Deposit Account No. 07-1185 upon which the undersigned is allowed to draw.

Respectfully submitted,

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